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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/057,959	01/29/2002	Alistair Neil Coles	1509-269	3543

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EXAMINER	
SELLERS, DANIEL R	

ART UNIT	PAPER NUMBER
2615	

DATE MAILED: 10/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/057,959	COLES ET AL.	
	Examiner	Art Unit	
	Daniel R. Sellers	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 November 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. In response to applicant's inquiry regarding the last Office action, the following corrective action is taken.

The period for reply of 3 MONTHS set in said Office Action is restarted to begin with the mailing date of this letter.

2. A corrected copy of the last Office Action is enclosed.

Response to Amendment

3. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

Priority

4. Acknowledgment is made of applicant's claim for foreign priority based on applications filed in the United Kingdom on 01/29/2001 and on 11/20/2001. It is noted, however, that applicant has not filed certified copies of the 0102239.0 application and the 0127751.6 application as required by 35 U.S.C. 119(b).

Claim Objections

5. The following is a quotation, in part, of section 2181 of the MPEP,

> A claim limitation will be interpreted to invoke 35 U.S.C. 112, sixth paragraph, if it meets the following 3-prong analysis:
>
> (A) the claim limitations must use the phrase "means for " or "step for; "
> (B) the "means for " or "step for " must be modified by functional language; and
> (C) the phrase "means for " or "step for " must not be modified by sufficient structure, material or acts for achieving the specified function.

6. **Claim 10** is objected to because the claim language uses means plus function language for several elements (i.e. "audio source means is arranged to ..." and "audio playing means being arranged to ..."), but other elements do not invoke the means plus function interpretation (i.e. "communication means" and "audio production means", individually, do not meet step (a) of the 3-prong analysis). Case law has shown that the language "means for" is not always necessary, and in this instance "means is/being arranged to" is sufficient to meet step (a) of the 3-prong analysis. However, means plus function interpretation is not invoked for this claim, because it is not clear, for the reasons stated above, if the applicant wishes to invoke means plus function interpretation. If the applicant wishes to invoke 35 U.S.C. 112, sixth paragraph, the claim must be amended to meet the 3-prong analysis currently used by the Office.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. **Claim 10** recites the limitation " for transmission over **the data link**..." in lines 10-11. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

9. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

10. **Claims 1-2, 5, 9-13, 16 and 20-22** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Lapicque, USPN 7,079,658 and Gehring, USPN 5,521,981.

11. Regarding **claim 1**, Lapicque teaches an audio source (col. 3, lines 47-61 and fig. 2, unit 210);

a playing terminal adapted to be coupled to the audio source by a data link (fig. 2, unit 220);

an audio transducer arrangement coupled to the playing terminal (fig. 2, units 290 and 295),

wherein the audio source is arranged to derive a plurality of audio components, each audio component comprising (a) audio data relating to aural content of an audible sound or track (col. 4, lines 4-23 and fig. 2, units 211-218), and (b) positional data, relative to the audio transducer arrangement, at which each audible sound or track can be perceived (col. 3, lines 47-61 and col. 4, lines 56-61). Although Lapicque does not teach transmitting a first set of spatially processed data at a first bit-rate, Lapicque teaches individually transmitting each of the audio components (col. 4, lines 12-24), to generate set of spatially processed data using the individual audio components (col. 4, line 56 - col. 5, line 4), and to output the set of spatially processed data to the audio transducer (col. 3, lines 47-54).

Gehring teaches an audio source arranged to (i) generate, from the plurality of audio components, a first set of spatially processed data for transmission over a data link at a first bit rate (col. 2, line 66 - col. 3, line 11), wherein the playing terminal is

arranged to receive the first set of spatially processed data, and to output the set of spatially processed data to the audio transducer (col. 4, lines 44-50). Gehring also teaches an embodiment performing sound positioning with some voices and other operations reserved for other voices (col. 6, lines 40-50), such as those taught by Lapicque, wherein different bit-rates are taught for different priority voices (col. 2, lines 31-49). In the combination, Gehring teaches a pre-processed set of voices, which reads on the first set of spatially processed data, and Lapicque teaches priority and non-priority audio sources. In the combination, it is obvious that a priority set of pre-processed audio sources have the higher bit-rate as compared to individual audio sources that are processed after transmission. It would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of Gehring and Lapicque for the purpose of saving computational time (Gehring, col. 2, lines 15-26).

12. Regarding **claim 2**, the further limitation of claim 1, Lapicque teaches a user control device coupled to the playing terminal and arranged to enable user-selection of one the audible sounds or tracks, corresponding to one of the audio components outputted from the audio transducer arrangement, as a focus sound or track (col. 4, lines 49-61).

13. Regarding **claim 5**, the further limitation of claim 2, see the preceding argument with respect to claim 2. It is inherent that a computer game, as taught by Lapicque, uses at least one button or switch for user input.

14. Regarding **claim 9**, the further limitation of claim 1, Lapicque teaches that the computing system includes a network-based device (col. 11, lines 8-13).

15. Regarding **claim 10**, see the preceding argument with respect to claim 1. The combination of Lapicque and Gehring teaches these features in an audio system.

16. Regarding **claim 11**, see the preceding argument with respect to claim 1. The combination teaches these features in an interactive audio system, such as a video game. It is implied that a first port receives audio from a remote source (Lapicque, col. 10, line 53 - col. 11, line 13) and a second port outputs the data (col. 2, lines 43-45).

17. Regarding **claim 12**, see the preceding argument with respect to claim 11. The combination teaches a method of operating a playing terminal with these features.

18. Regarding **claim 13**, the further limitation of claim 12, see the preceding argument with respect to claim 2. The combination teaches a user control device.

19. Regarding **claim 16**, the further limitation of claim 13, see the preceding argument with respect to claim 5. The combination teaches a user control device with a button.

20. Regarding **claim 20**, see the preceding argument with respect to claim 1. The combination teaches a computer as the primary user appliance, and therefore teaches this method on a computer readable medium.

21. Regarding **claim 21**, the further limitation of claim 12, Lapicque teaches a method of presenting different computer-based services, such that different audio transducers of the transducer arrangement are associated with the different computer-based services, and the audio transducers are arranged at different positions relative to

the user of the terminal so that the sounds originating at the different transducers are perceived by the user as originating from different directions (col. 4, lines 25-29). Lapicque also teaches that the high bit rate data is associated with a specific transducer (col. 5, lines 14-26 in view of col. 4, lines 25-29).

22. Regarding **claim 22**, the further limitation of claim 1, see the preceding argument with respect to claim 21. The combination teaches this feature.

23. **Claims 3-4 and 14-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Lapicque and Gehring as applied to claim 1 above, and further in view of the paper authored by Kobayashi.

24. Regarding **claim 3**, the further limitation of claim 2, see Kobayashi

... wherein the user control device comprises a position sensor for being mounted on a body part of a user, the position sensor being arranged to cause selection of an audible sound or track as the focus sound or track by means of generating position data indicating the relative position of the user's body part, the playing device thereafter comparing the position data with the positional data for each of the audio components so as to determine the audible sound or track to which the user's body part is directed. (p. 13, head interface paragraph)

The combination of Lapicque and Gehring teaches the features of the parent claims, however they do not teach the use of head tracking or using a position sensor on a body part for user input. Kobayashi teaches an audio browser, and in one feature is the ability to track the users head movement for the purpose of bringing one of a plurality of sounds into focus within a three-dimensional soundscape. It would have been obvious for one of ordinary skill in the art to combine the teachings of Lapicque, Gehring, and Kobayashi for the purpose of using a more natural user interface.

25. Regarding **claim 4**, the further limitation of claim 3, see the preceding argument with respect to claim 3. In the combination, Kobayashi teaches the use of a head-mountable sensor.

26. Regarding **claim 14**, the further limitation of claim 13, see the preceding argument with respect to claims 3 and 13. Kobayashi teaches the feature of head tracking to define user input.

27. Regarding **claim 15**, the further limitation of claim 14, see the preceding argument with respect to claim 14. Kobayashi teaches a head-mountable sensor.

28. **Claims 6 and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Lapicque and Gehring as applied to claim 1 above, and further in view of Frulla.

29. Regarding **claim 6**, the further limitation of claim 2, see the preceding argument with respect to claim 2. Lapicque and Gehring teach the features of claim 2, but they do not teach voice recognition. Frulla teaches a voice input system that interprets voice commands as those commands consistent with a user-controlled mouse (see abstract). It would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of Lapicque, Gehring, and Frulla for the purpose of hands free operation.

30. Regarding **claim 17**, the further limitation of claim 13, see the preceding argument with respect to claim 6. The combination of Lapicque, Gehring, and Frulla teaches this feature.

31. **Claims 7-8 and 18-19** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Lapicque and Gehring as applied to claim 1 above, and further in view of Slezak.

32. Regarding **claim 7**, the further limitation of claim 1, Lapicque teaches that the system (220) can be part of a system, such as an Internet capable device (col. 11, lines 8-13). However, neither Lapicque nor Gehring teach a wireless link. Slezak teaches that a wireless connection to the Internet can be utilized (col. 3, lines 53-65). It would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of Lapicque, Gehring, and Slezak for the purpose of mobility. One of ordinary skill in the art at the time of the invention can appreciate that a wired connection to the Internet versus a wireless connection would hinder mobility of the computing device.

33. Regarding **claim 8**, the further limitation of claim 7, see the preceding argument with respect to claim 7. Lapicque teaches a mobile telephone connection.

34. Regarding **claim 18**, the further limitation of claim 12, see the preceding argument with respect to claim 7. The combination teaches a wireless link.

35. Regarding **claim 19**, the further limitation of claim 18, see the preceding argument with respect to claim 8. The combination teaches a mobile telephone connection.

36. **Claims 23 and 24** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Lapicque and Gehring as applied to claim 1 above, and further in view of Cashion et al., USPN 5,809,149, Kamiya et al., USPN 6,487,572, and North et al., USPN 6,055,619 (hereinafter Cashion, Kamiya, and North respectively).

37. Regarding **claim 23**, see the preceding argument with respect to claim 1. Lapicque teaches a source computer arrangement for controlling an output arrangement of a playing terminal including plural audio output transducers, where it is taught that the different transducers are located at different positions about the terminal so that sounds originating at the different transducers are perceived to be originating from different directions (col. 4, lines 4-29). Both Lapicque and Gehring do not teach a bit resolution for positional data, wherein its bit rate exceeds a bit rate of the transmitted audio sources. However it is inherent that positional data is used to position the sound sources about a user and it intrinsically has a bit resolution.

Lapicque teaches priorities that define the assignment of bits used to transmit compressed audio data (col. 2, lines 31-49 and col. 4, lines 4-16). Any number of formats could be used to transmit the priority signal. Lapicque teaches that one can choose between different transmission technologies, and/or different audio formats. It is established in the art that audio sources are sampled at various sampling rates and various bit-rates to achieve a certain fidelity. Analog telephone lines are capable of transmitting audio at 64 kbps (kilobits per second), which is equivalent to an analogue signal sampled at 8 kHz at 8 bits. Compact disc (CD) audio is equivalent to 705.6 kbps per channel, wherein audio is sampled at 44.1 kHz with 16-bit resolution. It is well

known that MPEG 1, Layer 3 (MP3) data is a lossy format, and can have constant bit rates between 32 kbps and 320 kbps. Therefore an embodiment of Lapicque could transmit priority data, if the data was MP3 data, at 128 kbps and non-priority data at 64 kbps, or some other lower bit-rate. Neither Lapicque nor Gehring teach, or elude to, the bit-rate of positional information used in the head related transfer functions (HRTF)

Cashion teaches an audio system utilizing HRTF to localize sound sources (col. 1, lines 54-67). Cashion also teaches a requirement for the length of HRTF finite impulse response (FIR) filters, so that a certain degree of realism is created (col. 9, lines 44-51). Cashion suggests that a FIR filter with a delay of 3.25 ms is sufficient, and this corresponds to a filter with about 144 coefficients if a sampling rate of 44.1 kHz is used (i.e. 44,100 cycles/sec * .00325 sec = 144 coefficients). It would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of Lapicque, Gehring, and Cashion for the purpose of providing realistic HRTF filtering means. Cashion, however, does not teach how often the coefficients are updated.

Kamiya teaches another method of localizing sound sources using HRTF filters (col. 2, lines 50-58). Kamiya teaches that a HRTF filter needs to update its coefficients at least every 10 ms, so that listeners do not perceive variations (col. 10, lines 53-65). It is a reasonable assumption that the coefficients would update about every 8.3 ms, or at a refresh rate of 120 Hz. The teachings of Cashion and Kamiya teach that a HRTF filter has to update 144 coefficients 120 times a second for realistic, continuous filtering. It would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of Lapicque, Gehring, Cashion, and Kamiya for providing

realistic, perceptually continuous spatial audio. However the combination does not teach the bit resolution of the filter used to provide realistic, perceptually continuous filtering in the HRTF means.

North teaches methods for processing multiple data streams (abstract). Furthermore, North teaches that a 3D processing means uses filters with the same resolution as the input audio (col. 26, line 60 - col. 27, line 21). It would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of Lapicque, Gehring, Cashion, Kamiya, and North for the purpose of providing high fidelity spatialized audio. Therefore, in the combination the positional data is transmitted at a data rate of about 276 kbps (16 bits/coefficient * 144 coefficients * 120 cycles/sec = 276,480 bits/sec). In one combination the audio data would be transmitted around 192 kbps - 128 kbps and the positional data at a rate of 276 kbps, therefore the positional data rate exceeds the data rate of the audio data in this combination of teachings.

38. Regarding **claim 24**, the further limitation of claim 23, see the preceding argument with respect to claims 21 and 23. The combination teaches these features.

Conclusion

39. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Dutkovich, USPN 4,176,252 – Col. 12, lines 23-48, are directed towards individual control of audio tracks in a multi-track three dimensional audio space;

Zhou, USPN 5,500,673 - teaches bit-rates in telecommunication devices (col. 1, lines 20-56 and col. 14, lines 22-26);

Nakazawa, USPN 5,715,317 - teaches transmitting positional data (i.e. filter coefficients) over a computer bus (i.e. a data link) (col. 6, line 65 - col. 7, line 8);

Mukojima et al., USPN 5,768,393 - teaches positional data of a sound generated from a polygon (abstract and Fig. 4);

Hassan et al., USPN 5,974,376 - teaches the transmission of extra details of an audio signal when prompted (see Summary of the Invention);

Connor et al., USPN 6,011,851 - teaches spatialized audio, wherein different sound sources have different priorities (see Summary of the Invention); and

Yamazaki, USPN 6,343,130 - teaches motivation for different bit rates in a system performing sound localization (col. 2, lines 38-58).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel R. Sellers whose telephone number is 571-272-7528. The examiner can normally be reached on Monday to Friday, 9am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571)272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DRS

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